



# Biomass Program

## Thermochemical R&D

### Causticizing for Black Liquor Gasifiers

Causticization is an integral step in the recovery of pulping chemicals from spent pulping liquor, also known as black liquor. In causticization, the sodium carbonate in the black liquor is converted to sodium hydroxide which is recovered and recycled back into the pulping process.

The goal of this research is to identify causticizing technologies that meet performance requirements and are technically and economically viable for use in black liquor gasification (BLG). Researchers will work to resolve the technical barriers to commercialization and integration of these technologies in the pulp mill, and will perform techno-economic evaluations.

The causticizing technologies to be tested include titanate, manganate, and borate. The technologies will be tested in high-temperature (entrained gasifier) and low-temperature (fluidized bed gasifier) black liquor gasification systems.

### R&D Pathway

Researchers will determine whether a high yield of causticization or an acceptable degree of partial causticization can be achieved for each BLG technology. The successful causticizing technologies will be evaluated during repeated recycling of the causticizing agent, and viable methods of purging the dregs will be identified.

Barriers to commercialization and mill integration of the most viable processes will be addressed with the goal of integrating technologies with pilot or demonstration-scale gasifiers. Techno-economic evaluations of the most promising technologies will be performed in the latter stages of the project.

### Benefits

- **Contribute to the successful commercialization of black liquor gasification systems**

### Applications

**The results of this project can be leveraged to improve the performance and viability of other black liquor gasification systems.**

### Project Partners

**Institute of Paper Science & Technology, Georgia Institute of Technology  
Jacobs Consultancy**

### Project Period

**FY 2003 – FY 2004**

### For more information contact:

**Joel Chaddock**  
**National Energy Technology Lab**  
[Joel.Chaddock@netl.doe.gov](mailto:Joel.Chaddock@netl.doe.gov)

**EERE Information Center**  
**1-877-EERE-INF (1-877-337-3463)**

**Visit the Web site for the Office of the Biomass Program (OBP) at**  
[www.eere.energy.gov/biomass.html](http://www.eere.energy.gov/biomass.html)

**September 2004**